

Etodolac (Lodine®)

Selected References:

- ANI Pharmaceuticals. 2024. Etodolac product labeling. Available at: <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=420c7b62-3bea-4d6b-82e0-ab1c176c7f1e>. Accessed 21 July 2025.
- Choi E-Y, et al. 2023. Neonatal and maternal adverse outcomes and exposure to nonsteroidal anti-inflammatory drugs during early pregnancy in South Korea: a nationwide cohort study. *PLoS Med*, 20(2):e1004183.
- Dawood MY. 1993. Nonsteroidal antiinflammatory drugs and reproduction. *Am J Obstet Gynecol*, 169(5):1255-1265.
- Daniel S, et al. 2012. Major Malformations Following Exposure to Nonsteroidal Antiinflammatory Drugs During the First Trimester of Pregnancy. *J Rheumatol* 39(11) 2163-2169.
- Daniel S, et al. 2014. Fetal exposure to nonsteroidal anti-inflammatory drugs and spontaneous abortion. *Can Med Assoc J* 186(5):E177-E182.
- Daniel S, et al. 2015. NSAIDs and spontaneous abortions – true effect or an indication bias? *Br J Clin Pharmacol*, 80(4):750-754.
- Dathe K, et al. 2018. No evidence of adverse pregnancy outcome after exposure to ibuprofen in the first trimester—Evaluation of the national Embryotox cohort. *Reproductive Toxicology*, 79: 32-38.
- Ericson A and Kallen BA. 2001. Nonsteroidal anti-inflammatory drugs in early pregnancy. *Reprod Toxicol*, 15:371-
- Janssen NM and Genta MS. 2000. The effects of immunosuppressive and anti-inflammatory medication on fertility, pregnancy, and lactation. *Arch Intern Med*, 160:610-619.
- Nezvalova-Henriksen K et al. 2013. Effects of ibuprofen, diclofenac, naproxen, and piroxicam on the course of pregnancy and pregnancy outcome: a prospective study. *BJOG*, 120(8):948-959.
- Nielsen GL, et al. 2001. Risk of adverse birth outcome and miscarriage in pregnant users of non-steroidal anti-inflammatory drugs: population based observational study and case-control study. *BMJ*, 322(7281):266-270.
- Nielsen GL, et al. 2004. Danish group reanalyses miscarriage in NSAID users. *BMJ*, 328(7431):109.
- U.S. Food and Drug Administration. 2020. FDA recommends avoiding use of NSAIDs in pregnancy at 20 weeks or later because they can result in low amniotic fluid. Available at: <https://www.fda.gov/drugs/drug-safety-and-availability/fda-recommends-avoiding-use-nsaids-pregnancy-20-weeks-or-later-because-they-can-result-low-amniotic>. Accessed 21 July 2025.

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Selected References

- Albadrani MS, et al. 2024. Pesticide exposure and spontaneous abortion risk: a comprehensive systematic review and meta-analysis. *Ecotoxicol Environ Saf*, 284:117000.
- Aman H, et al. 2024. Determinants of externally visible birth defects among perinatal deaths at Adama Comprehensive Specialized Hospital: a case-control study. *BMC Pediatr*, 24(1):260
- Ashley-Martin J, et al. 2025. Gestational urinary concentrations of glyphosate and aminomethylphosphonic acid in relation to preterm birth: the MIREC study. *J Expo Sci Environ Epidemiol*, 35(5):876-881.
- Baba S, et al. 2025 Associations between antenatal organophosphate pesticide exposure and pregnancy outcomes: The Japan Environment and Children's Study (J ECS). *Sci Total Environ*, 997:180117.
- Benitez L, et al. 2024. Maternal lifestyle and prenatal risk factors for childhood leukemia: a review of the existing evidence. *Fetal Diagn Ther*, 51(4):395-410.
- Brennan Kearns P, et al. 2024. Association of exposure to mixture of chemicals during pregnancy with cognitive abilities and fine motor function of children. *Environ Int*, 185:108490.
- Bommarito PA, et al. 2024. Prenatal exposure to nonpersistent chemicals and fetal-to-childhood growth trajectories. *Epidemiology*, 35(6):874-884.
- Buckley JD, et al. 2000. Pesticide exposures in children with non- Hodgkin lymphoma. *Cancer* 89(11):2315-21.
- Cajachagua-Torres KN, et al. 2024. Exposure to endocrine disruptors in early life and neuroimaging findings in childhood and adolescence: a scoping review. *Curr Environ Health Rep*, 11(3):416-442.
- Conejo-Bolaños LD, et al. 2024. Prenatal current-use pesticide exposure and children's neurodevelopment at one year of age in the Infants' Environmental Health (ISA) birth cohort, Costa Rica. *Environ Res*, 249:118222.
- Carmichael SL, et al. 2016. Residential agricultural pesticide exposures and risks of selected birth defects among offspring in the San Joaquin Valley of California. *Birth Defects Res A Clin Mol Teratol*. 106(1):27-35.
- Coleman B, et al. 2025. Pesticides and neurodevelopment of children in low and middle-income countries: a systematic review. *PLoS One*, 20(6):e0324375.
- Colopi A, et al. 2024. Dietary exposure to pesticide and veterinary drug residues and their effects on human fertility and embryo development: a global overview. *Int J Mol Sci*, 25(16):9116.
- Chen J, et al. 2025. Endocrine disrupting chemicals exposure and health: an umbrella review. *Ecotoxicol Environ Saf*, 302:118574.
- Contreras HR, et al. 1999. Morphological alterations in mouse testis by a single dose of malathion. *J Exp Zool* 284:355-9.
- Darwish SF, et al. 2025. Insecticides and testicular health: mechanisms of injury and protective natural products. *Naunyn Schmiedebergs Arch Pharmacol*, 398(9):11229-11259.
- Davis B, et al. 2024. Association between prenatal exposure to indoor residual spraying insecticides and infection rates among South African children participating in the Venda Health Examination of

Mothers, Babies and their Environment (VHEMBE). *Sci Total Environ*, 918:170483.

- Ellis LB, et al. 2024. Adult organophosphate and carbamate insecticide exposure and sperm concentration: a systematic review and meta-analysis of the epidemiological evidence. *Environ Health Perspect*, 131(11):116001.
- Fage-Larsen B, et al. 2024. Exposure to chlorpyrifos and pyrethroid insecticides and symptoms of attention deficit hyperactivity disorder (ADHD) in preschool children from the Odense Child Cohort. *Environ Res*, 241:117679.
- Fiedler N, et al. 2025. A birth cohort observational study to assess the association of prenatal biomarkers of organophosphates with visual attention, recognition memory and information processing among Thai infants. *Environ Res*, 274:121197.
- Elsiwi B, et al. 2024. Maternal exposure to pyrethroid insecticides during pregnancy and respiratory allergy symptoms among children participating in the Venda Health Examination of Mothers, Babies and their Environment (VHEMBE). *Environ Res*, 242:117604.
- Environmental Protection Agency. Spray drift of pesticides. Retrieved December 2005, from: <http://www.epa.gov/pesticides/factsheets/spraydrift.htm> Environmental Protection Agency. What is a pesticide? Retrieved December 2005, from: <http://www.epa.gov/pesticides/about/index.htm>
- Eskenazi B, et al. 2004. Association of in utero organophosphate pesticide exposure and fetal growth and length of gestation in an agricultural population. *Environ Health Perspect* 112:116-1124.
- Fishel F. 2017. Pesticide Use Trends in the United States: Agricultural Pesticides. Available at: <http://edis.ifas.ufl.edu/pi176> [Accessed 10/2017].
- Furlong MA, et al. 2025. Preconception and first trimester exposure to pesticides and associations with stillbirth. *Am J Epidemiol*, 194(1):44-55.
- Gao Y, et al. 2024. Childhood exposure to organophosphate pesticides: functional connectivity and working memory in adolescents. *Neurotoxicology*, 103:206-214.
- Gebremariam BM, et al. 2025. Birth prevalence and determinants of neural tube defects among newborns in Ethiopia: a systematic review and meta-analysis. *PLoS One*, 20(1):e0315122.
- Genard-Walton M, et al. Prenatal exposures to persistent organic pollutants and menstrual characteristics in girls at age 12 in the French PELAGIE cohort. *Environ Res*, 285(Pt 3):122445.
- Goodrich AJ, et al. 2025. Professionally and non-professionally applied household insecticides during pregnancy and early life and their associations with autism spectrum disorder and developmental delay in the CHARGE case-control study. *Environ Res*, 267:120651.
- Goodrich AJ, et al. 2025. Pet flea and tick control exposure during pregnancy and early life associated with decreased cognitive and adaptive behaviors in children with developmental delay and autism spectrum disorder. *Int J Environ Res Public Health*, 22(7):1149.
- Grether JK, et al. 1987. Exposure to aerial malathion application and the occurrence of congenital anomalies and low birthweight. *Am J Public Health* 77:1009-1010.
- Grijinu M, et al. 2024. Prenatal factors in the development of allergic diseases. *Int J Mol Sci*, 25(12):6359. doi: 10.3390/ijms25126359.
- Grindstad T, et al. 2025. Environmental exposures and fecundability: the Norwegian Mother, Father, and Child Cohort study. *Int J Hyg Environ Health*, 263:114492.
- Guesdon L, et al. 2025. Maternal exposure to pesticides and gestational diabetes mellitus in the Elfe cohort. *Environ Res*, 284:122275.
- Gupta P. 1990. Teratogenic effects of cypermethrin in rats. *J Environ Biol* 11(2):121-126.
- Haas DM, et al. 2025. First trimester urine glyphosate concentrations and gestational diabetes in nulliparas: a nested case-control study. *Environ Health*, 24(1):71.
- Hall M, et al. 2025. Associations of prenatal glyphosate exposure with child neurodevelopment in a Canadian pregnancy cohort study. *Environ Int*, 199:109480.
- Hamed MA, et al. 2023. Impact of organophosphate pesticides exposure on human semen parameters and testosterone: a systematic review and meta-analysis. *Front Endocrinol (Lausanne)*, 14:1227836.
- Hass U, et al. 2017. Combined exposure to low doses of pesticides causes decreased birth weights in rats.

Reprod Toxicol. 72:97-105.

- Hossain F, et al. Effects of pesticide use on semen quality among farmers in rural areas of Sabah, Malaysia. *J Occup Health*. 2010;52(6):353-60.
- Huang Q, et al. 2025. Association of maternal urinary pesticide metabolites with neonatal birth outcomes and the moderating effects of iodine. *Ecotoxicol Environ Saf*, 297:118261.
- Inman ZC, Flaws JA. 2024. Impact of real-life environmental exposures on reproduction: endocrine-disrupting chemicals, reproductive aging, and menopause. *Reproduction*, 168(5):e240113.
- Jankowska A, et al. 2024. The association between prenatal pyrethroids exposure and children's health – current research. *Int J Occup Med Environ Health*, 37(4):381-402.
- Jaskulak M, et al. 2025. Understanding the role of endocrine disrupting chemicals as environmental obesogens in the obesity epidemic: a comprehensive overview of epidemiological studies between 2014 and 2024. *Ecotoxicol Environ Saf*, 299:118401.
- Jenkins HM, et al. 2024. Gestational glyphosate exposure and early childhood neurodevelopment in a Puerto Rico birth cohort. *Environ Res*, 246:118114.
- Katunzi DM, et al. 2025. Prevalence of neural tube defects and their associated factors in Sub-Saharan Africa: a systematic review. *Childs Nerv Syst*, 41(1):314.
- Kennedy D, et al. 2005. Pregnancy outcome following exposure to permethrin and use of teratogen information. *Am J Perinatol* 22(2):87-90.
- Khera KS, et al. 1979. Teratologic assessment of maleic hydrazide and daminozide, and formulations of ethoxyquin, thiabendazole and naled in rats. *J Environ Sci Health B* 14(6):53-77.
- Khera K, et al. 1982. Teratogenicity study on pyrethrum and rotenone (natural origin) in pregnant rats. *J Toxicol Environ Health* 10:111-119.
- Kishi R, et al. 2025. The potential health risks of exposure to environmental chemicals – global implications for future generations. *Proc Jpn Acad Ser B Phys Biol Sci*, 101(4):197-215.
- Krishnapura SR, et al. 2024. County-level atrazine use and gastroschisis. *JAMA Netw Open*, 7(5):e2410056.
- Kumar SN, et al. 2025. Pesticide exposure in agricultural workplaces and resultant health effects in women. *Birth Defects Res*, 117(4):e2460.
- Li M, et al. 2024. Successful delivery following acute maternal diquat poisoning. *Clin Toxicol (Phila)*, 62(4):272-273.
- Li N, et al. 2025. Associations between follicular fluid and serum neonicotinoid insecticide exposure and sex hormones and ovarian reserve: a retrospective study among women undergoing IVF/ICSI. *Ecotoxicol Environ Saf*, 302:118544.
- Li P, Chen Z. 2024 Association of blood isobutyronitrile with infertility among reproductive-aged women: results from the NHANES cohort. *Ecotoxicol Environ Saf*, 284:117010.
- Liu H, et al. 2021. Organophosphate pesticide exposure: Demographic and dietary predictors in an urban pregnancy cohort. *Environ Pollut*. 283:116920.
- Liu F, et al. 2025. Maternal pesticide exposure and risk of birth defects: a population-based cross-sectional study in China. *Front Public Health*, 12:1489365.
- Ma X, et al. 2002. Critical windows of exposure to household pesticides and risk of childhood leukemia. *Environ Health Perspect* 110(9):955-60.
- Machin MG and McBride WG. 1989. Teratological study of malathion in the rabbit. *J Toxicol Environ Health* 26(3):249-53.
- Martin FA, et al. 2025. Domestic use of solvents and pesticides and the risk of hypospadias in offspring: a case-control study from Brittany, France. *Birth Defects Res*, 117(5):e2476.
- Martinez V, et al. 2024. Exposure to environmental chemicals and infertility among US reproductive-aged women. *Int J Environ Res Public Health*, 21(12):1541.
- Medley EA, et al. 2025. Prenatal organophosphate pesticide exposure and sex-specific estimated fetal size. *Am J Epidemiol*, 194(4):954-962.
- Meinert R, et al. 1996. Childhood leukaemia and exposure to pesticides: results of a case-control study in

northern Germany. *Eur J Cancer* 32A(11):1943-8.

- Menant L, et al. 2025. Prenatal and prepubertal exposures to organochlorine compounds and perfluoroalkyl substances and pubertal development at age 12: The PELAGIE cohort study. *Environ Int*, 205:109845.
- Miyamoto J. 1976. Degradation, metabolism and toxicity of synthetic pyrethroids. *Environ Health Criter* 14:15-28.
- Moses M. 1993. Pesticides: in *Occupational and Environmental Reproductive Hazards: A Guide for Clinicians*. Paul, M (ed). Williams & Wilkins: 296-305. Patel S, Sangeeta S. Pesticides as the drivers of neuropsychotic diseases, cancers, and teratogenicity among agro-workers as well as general public. *Environ Sci Pollut Res Int*. 2019 Jan;26(1):91-100.
- Navarrete-Meneses MDP, et al. 2024. Environmental pollution and risk of childhood cancer: a scoping review of evidence from the last decade. *Int J Mol Sci*, 25(6):3284.
- Nehzomi ZS, Shirani K. 2025. Investigating the role of food pollutants in autism spectrum disorder: a comprehensive analysis of heavy metals, pesticides, and mycotoxins. *Naunyn Schmiedebergs Arch Pharmacol*, 398(3):2511-2533.
- Nimmapirot P, et al. 2024. Predictors of executive function among 2 year olds from a Thai birth cohort. *Infant Behav Dev*, 74:101916.
- Normann SS, et al. 2025. Impact of prenatal and childhood exposure to pyrethroids and chlorpyrifos on motor skills in 7-year-old children from the Odense Child Cohort. *Environ Res*, 284:122225.
- Normann SS, et al. 2024. Prenatal exposure to pyrethroids and chlorpyrifos and IQ in 7-year-old children from the Odense Child Cohort. *Neurotoxicol Teratol*, 103:107352.
- Normann SS, et al. 2025. Pyrethroid exposure biomarker 3-phenoxybenzoic acid (3-PBA) binds to transthyretin and is positively associated with free T3 in pregnant women. *Int J Hyg Environ Health*, 264:114495.
- Novianti L, Irwinda R. 2025. Exploring prenatal risk factors associated with congenital anomalies among newborns in national referral hospital, Indonesia. *Med J Malaysia*, 80(5):582-588.
- Nuseir KQ, et al. 2022. Organophosphate pesticide exposure prenatally influence on pregnancy outcomes. *J Matern Fetal Neonatal Med*, 35(25):4841-4846.
- Oberlin A, et al. 2024. Effect of indoor residual spraying on malaria in pregnancy and pregnancy outcomes: a systematic review. *Am J Trop Med Hyg*, 112(2):253-265.
- Oladosu JI, Flaws JA. 2025. The impact of neonicotinoid pesticides on reproductive health. *Toxicol Sci*, 203(2):131-146.
- Patel S, Sangeeta S. Pesticides as the drivers of neuropsychotic diseases, cancers, and teratogenicity among agro-workers as well as general public. *Environ Sci Pollut Res Int*. 2019 Jan;26(1):91-100.
- Pettigrew SM, et al; and the National Birth Defects Prevention Study. 2016. Paternal and joint parental occupational pesticide exposure and spina bifida in the National Birth Defects Prevention Study, 1997 to 2002. *Birth Defects Res A Clin Mol Teratol*. 106(11):963-971.
- Pham The T, et al. 2024. Effects of dioxin exposure on reproductive and thyroid hormone levels and male sexual function in airbase military workers in Vietnam. *Environ Sci Pollut Res Int*, 31(35):47644-47654. Puche-Juarez M, et al. 2023. The role of endocrine disrupting chemicals in gestation and pregnancy outcomes. *Nutrients*, 15(21):4657.
- Onyije FM, et al. 2024. Risk factors for childhood brain tumours: a systematic review and meta-analysis of observational studies from 1976 to 2022. *Cancer Epidemiol*, 88:102510.
- Onyije FM, et al. 2025. Risk factors of neuroblastoma: a systematic review and meta-analysis. *Front Public Health*, 13:1576101.
- Puvvula J, et al. 2025. Gestational exposure to environmental chemical mixtures and cognitive abilities in children: a pooled analysis of two North American birth cohorts. *Environ Int*, 196:109298.
- Qu P, et al. 2024. Risk-prediction nomogram for congenital heart disease in offspring of Chinese pregnant women. *BMC Pregnancy Childbirth*, 24(1):509.
- Reynolds P, et al. 2005. Agricultural pesticide use and childhood cancer in California. *Epidemiology*, 16(1):93-100.
- Reynier E, Rubin E. 2025. Glyphosate exposure and GM seed rollout unequally reduced perinatal health. *Proc*

Natl Acad Sci U S A, 122(3):e2413013121.

- Rodrigues MB, et al. Pesticides and human health. J Pediatr (Rio J), 101 Suppl 1(Suppl 1):S70-S76.
- Rouget F, et al. 2023. Meconium concentrations of pesticides and risk of hypospadias: a case-control study in Brittany, France. Epidemiology, 35(2):185-195.
- Rueber MD. 1985. Carcinogenicity and toxicity of malathion and malaoxon. Environ Res, 37(1):119-53153.
- Sagiv SK, et al. 2024. Prenatal and childhood exposure to organophosphate pesticides and functional brain imaging in young adults. Environ Res, 242:117756.
- Sehgal N, et al. 2025. Associations of prenatal tobacco and insecticide co-exposures with neurobehavioral responses among children born to pregnant women exposed to cannabis. Neurotoxicol Teratol, 111:107536.
- Shapiro GD, et al. 2016. Exposure to organophosphorus and organochlorine pesticides, perfluoroalkyl substances, and polychlorinated biphenyls in pregnancy and the association with impaired glucose tolerance and gestational diabetes mellitus: The MIREC Study. Environ Res., 147:71-81.
- Shulhai AM, et al. 2024. Which is the current knowledge on man-made endocrine- disrupting chemicals in follicular fluid? An overview of effects on ovarian function and reproductive health. Front Endocrinol (Lausanne), 15:1435121.
- Sierra-Diaz E, et al. 2019. Urinary pesticide levels in children and adolescents residing in two agricultural communities in Mexico. Int J Environ Res Public Health, 16(4):562.
- Sonawane B. 1995. Chemical contaminants in human milk: an overview. Environ Health Perspect, 103(Suppl 6):197-205.
- Stone AM, et al. 2025. Re-evaluating the use of glyphosate-based herbicides: implications on fertility. Reprod Sci, 32(4):950-964.
- Sierra-Diaz E, et al. 2019. Urinary Pesticide Levels in Children and Adolescents Residing in Two Agricultural Communities in Mexico. Int J Environ Res Public Health. 2019 Feb 15;16(4). pii: E562. doi: 10.3390/ijerph16040562.
- Swan SH, et al. 2003. Semen quality in relation to biomarkers of pesticide exposure. Environ Health Perspect, 111:1478- 1483.
- Tang W, et al. 2025. Exposure to individual organophosphate esters and their mixture in relation to semen quality in Chinese men. Environ Int, 205:109907.
- Tartaglione AM, et al. 2024. The contribution of environmental pollutants to the risk of autism and other neurodevelopmental disorders: a systematic review of case-control studies. Neurosci Biobehav Rev, 164:105815.
- Tesfay N, et al. 2023. Birth prevalence and risk factors of neural tube defects in Ethiopia: a systematic review and meta-analysis. BMJ Open, 13(11):e077685.
- Thomas DC, et al. 1992. Reproductive outcomes in relation to malathion spraying in the San Francisco Bay Area, 1981-1982. Epidemiology, 3(1):32-39.
- Tran TT, et al. 2024. Prevalence of autism spectrum disorder diagnosed according to DSM-5 criteria and associated factors in preschoolers in southern Vietnam. Clin Ter, 175(6):405-411.
- Uldbjerg CS, et al. 2025. Prenatal exposure to organochlorine pesticides and polychlorinated biphenyls and risk of testicular germ cell cancer later in life. Sci Total Environ, 970:179054.
- Uwamahoro C, et al. 2024. Assessing the risks of pesticide exposure: implications for endocrine disruption and male fertility. Int J Mol Sci, 25(13):6945.
- Wager JL, Thompson JA. 2025. Development and child health in a world of synthetic chemicals. Pediatr Res, 97(6):1833-1839.
- Wang H, et al. 2025. Prenatal exposure to a mixture of organophosphate ester and organophosphorus pesticides in relation to child neurodevelopment in the Shanghai Birth Cohort. Ecotoxicol Environ Saf, 290:117618.
- Winchester P, et al. 2016. County-level pesticide use and risk of shortened gestation and preterm birth. Acta Paediatr., 105(3):e107-15115.
- Wylie B, et al. 2025. Evaluation of gestational nonpersistent pesticide exposure with newborn size and

gestational length in rural Ghana using a novel time-varying extension of multiple informant models. Environ Int, 196:109292.

- Zhang B, et al. 2024. Prenatal exposure to neonicotinoid insecticides, fetal endocrine hormones and birth size: Findings from SMBCS. Environ Int, 193:109111.

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Selected References:

- Brooks C, et al. 1977. Linear growth of children with limb deformities following exposure to thalidomide in utero. Acta Paediatr Scand, 66:673-675.
- Castilla E, et al. 1996. Thalidomide, a current teratogen in South America. Teratology, 54:273-277.
- Gao S, et al. 2020. Recent advances in the molecular mechanism of thalidomide teratogenicity. Biomed Pharmacother, 127:110114.
- Guo L, et al. 2023. Inflammatory bowel disease can reduce ovarian reserve function in women: a systematic review and meta-analysis. Medicine (Baltimore), 102(11):e33113.
- Gollop T, et al. 1987. Prenatal diagnosis of thalidomide syndrome. Prenat Diagn, 7:295-298.
- Ito T, et al. 2020. Molecular mechanisms of thalidomide and its derivatives. Proc Jpn Acad Ser B Phys Biol Sci, 96(6):189-203.
- Klein-Weigel PF, Ding-Greiner C. 2025. Cardiovascular manifestations of thalidomide embryopathy. Vasa, 54(5):299-304.
- Mahesri M, et al. 2024. Trends in use and evidence of adherence to risk evaluation and mitigation strategy pregnancy testing requirements for thalidomide, lenalidomide, and pomalidomide in the

USA, 2000-2020. Drug Saf, 47(9):909-919.

- Miller MT, et al. 2009. Thalidomide and misoprostol: ophthalmologic manifestations and associations both expected and unexpected. Birth Defects Res A Clin Mol Teratol, 85(8):667-676.
- Peng X, et al. 2017. Thalidomide results in diminished ovarian reserve in reproductive age female IBD patients. Medicine (Baltimore), 96(21):e6540.
- Prescriber Guide to (THALOMID REMS™) Risk Evaluation and Mitigation Strategy (REMS)™ Program. (2014). Retrieved from <https://www.fda.gov/media/79047/download>
- Rodier PM, 2000. The early origins of autism. Scientific American, 282:56-63.
- Rodier PM. 2002. Converging evidence for brain stem injury in autism. Dev Psychopathol, 14(3):537-557.
- Smithells R. 1992. Recognition of thalidomide defects. J Med Genet, 29:716-723.
- Sterling D, et al. 1997. Thalidomide: a surprising recovery. J Am Pharm Assn, 3:306-313.
- Stromland K, et al. 1993. Thalidomide embryopathy: revisited 27 years later. Acta Ophthalmol (Copen), 71:238-245.
- Stromland K, et al. 1994 Autism in the thalidomide embryopathy: a population study. Dev. Med. Child Neurol, 36:351-356.
- Vargesson N. 2019. The teratogenic effects of thalidomide on limbs. J Hand Surg Eur Vol, 44(1):88-95.
- Xiang P, et al. 2023. Clinical characteristics and risk factors of ovarian reserve decreases in women with Crohn's disease: a case-control study. J Ovarian Res, 16(1):34.

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Selected References:

- Bateman BT, et al. 2015. Statins and congenital malformations: cohort study. *BMJ*,350:h1035.
- Boyle AK, et al. 2019. Repurposing simvastatin as a therapy for preterm labor: evidence from preclinical models. *FASEB J*, 33:2743-2758.
- Chang J, et al. 2021. Perinatal outcomes after statin exposure during pregnancy. *JAMA Netw Open*, 4(12):e2141321.
- Cleary KL, et al. 2014. Challenges of studying drugs in pregnancy for off-label indications: pravastatin for preeclampsia prevention. *Semin Perinatol*, 38(8):523-527.
- Constantine MM, Cleary K. 2013. Pravastatin for the prevention of preeclampsia in high-risk pregnant women. *Obstet Gynecol*, 121(2 Pt 1):349-353.
- Döbert M, et al. 2021. Pravastatin versus placebo in pregnancies at high risk of term preeclampsia. *Circulation*, 144(9):670-679.
- Hirsch A, et al. 2022. The effect of statins exposure during pregnancy on congenital anomalies and spontaneous abortions: A systematic review and meta-analysis. *Front Pharmacol*, 13.
- Jay RH, et al. 1991. Effects of pravastatin and cholestyramine on gonadal and adrenal steroid production in familial hypercholesterolaemia. *Br J Clin Pharmacol*, 32(4):417-422.
- Kane AD, et al. 2022. Combined statin and glucocorticoid therapy for the safer treatment of preterm birth. *Hypertension*, 80(4).
- Kay HY, et al. 2025. Pregnancy and neonatal outcomes after fetal exposure to statins among women with dyslipidemia: a nationwide cohort. *Eur J Pediatr*, 184(6):340.
- Kazmin A, et al. 2007. Risk of statin use during pregnancy: a systematic review. *J Obstet Gynaecol Can*, 29(11):906.
- Kusters DM, et al. 2012. Statin use during pregnancy: a systematic review and meta-analysis. *Expert Rev Cardiovasc Ther*, 10(3):363-378.
- Maier SM, et al. 2018. The potential role of statins in preeclampsia and dyslipidemia during gestation: a narrative review. *Expert Opin Investig Drugs*, 27(5):427-435.
- McElhatton P. 2005. Preliminary data on exposure to statins during pregnancy. *Reprod Toxicol*, 20:471-472.
- Morton S, Thangaratinam S. 2013. Statins in pregnancy. *Curr Opin Obstet Gynecol*, 25(6):433-440.
- Mudd LM, et al. 2012. Maternal lipids at mid-pregnancy and the risk of preterm delivery. *Acta Obstet Gynecol Scand*, 91(6):726-735.
- Ofori B, et al. 2007. Risk of congenital anomalies in pregnant users of statin drugs. *Br J Clin Pharmacol*, 64(4):496-509.
- Omolaoye TS, et al. 2022. Statins and Male Fertility: Is There a Cause for Concern? *Toxics*, 10(627):1-19.
- Raham DF, et al. 2021. Management of familial hypercholesterolemia in pregnancy. *Curr Opin Lipidol*, 32(6):370-377.
- Svendsen K, et al. 2025. Risk of adverse pregnancy outcomes and impact of statin use in pregnant women with familial hypercholesterolemia. *Atherosclerosis*, 408:120442.
- Taguchi N, et al. 2008. Prenatal exposure to HMG CoA reductase inhibitors: effects on fetal and neonatal outcomes. *Reprod Toxicol*, 26(2):175-177.
- U.S. Food and Drug Administration. 2021. Statins: drug safety communication – FDA requests removal of strongest warning against using cholesterol-lowering statins during pregnancy. Posted July 20, 2021. Available at URL: <https://www.fda.gov/safety/medical-product-safety-information/statins-drug-safety-communication-fda-requests-removal-strongest-warning-against-using-cholesterol>.

- Vahedian-Azimi A, et al. 2021. Effects of statins on preeclampsia: a systematic review. *Pregnancy Hypertens*, 23:123-130.
- Vahedian-Azimi A, et al. 2021. A systematic review and meta-analysis on the effects of statins on pregnancy outcomes. *Atherosclerosis*, 336:1-11.
- Vahedian-Azimi A, et al. 2021. Fetal toxicity associated with statins: a systematic review and meta-analysis. *Atherosclerosis*, 327:59-67.
- Winterfeld U, et al. 2013. Pregnancy outcome following maternal exposure to statins: a multicentre prospective study. *BJOG*, 120(4):463-471.
- Wolfgang P, et al. 2004. Pregnancy outcome after medication with HMG-CoA reductase inhibitors in the first trimester. *Reprod Toxicol*, 19:254-255.

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Etodolac (Lodine®)

Selected References:

- Beeder LA, et al. 2010. Effect of antidepressant medications on semen parameters and male fertility. *International Journal of Urology* 27.1: 39-46.
- Dao K, et al. 2023. Reproductive safety of trazodone after maternal exposure in early pregnancy: a comparative ENTIS cohort study. *Journal of Clinical Psychopharmacology* 43.1: 12.
- Einarson A, et al. 2003. A multicentre prospective controlled study to determine the safety of trazodone and nefazodone use during pregnancy. *Can J Psychiatry* 48(2):106-110.
- Einarson A, et al. 2009. Incidence of major malformations in infants following antidepressant exposure in pregnancy: results of a large prospective cohort study. *Can J Psychiatry* 54(4):242-246.
- Glasgow-Osment B, et al. 2025. The effects of trazodone exposure during pregnancy on fetal outcomes: a systematic review. *Eur J Clin Pharmacol* 81: 1401-1408.
- Khazaie H, et al. 2013. Insomnia treatment in the third trimester of pregnancy reduces postpartum depression

symptoms: a randomized clinical trial. Psychiatry Res. 210(3):901-5.

- McElhatton PR, et al. 1996. The outcome of pregnancy in 689 women exposed to therapeutic doses of antidepressants. A collaborative study of the European Network of Teratology Information Services (ENTIS). Reprod Toxicol 10:285-94.
- Misri S and Sivertz K. 1991. Tricyclic drugs in pregnancy and lactation: a preliminary report. Int J Psychiatry Med 21:157-171.
- Rivett KF and Barcelona PS. 1974. Toxicology of trazodone. Mod Probl Pharmacopsychiatry 9:76-86.
- Rosa F. 1994. Medicaid antidepressant pregnancy exposure outcomes. Reprod Toxicol 8(5):444-445.
- Verbeeck RK, et al. 1986. Excretion of trazodone in breast milk. Br J Clin Pharmacol 22(3):367-370.

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